

CLAIMS

What is claimed is:

1. An apparatus for hot gas blow-forming a sheet metal blank into a finished component, said apparatus comprising:

a flask having an exterior periphery and an interior periphery, said flask being sized and adapted to receive different dies of various size and shape for hot gas blow-forming, said flask further having sides with top surfaces for supporting said sheet metal blank thereon;

a heater plate positioned within said flask and adapted to contact one of said different dies for separately heating said one of said different dies;

said one of said different dies having a forming surface for forming said sheet metal blank into said finished component, said one of said different dies further having an exterior periphery and being mounted within said flask against said heater plate; and

a cover positioned opposite said flask and having portions adapted to engage said sheet metal blank against said top surfaces of said sides of said flask, said cover thereby at least partially defining a pressure chamber between said sheet metal blank and said cover.

2. An apparatus as claimed in claim 1, wherein a peripheral gap is established between said exterior periphery of said one of said different dies and said interior periphery of said flask, said apparatus further comprising a seal mounted to at least one of said flask and said one of said different dies so as to bridge said peripheral gap.

3. An apparatus as claimed in claim 2, wherein said seal has one end sealingly attached to said one of said different dies and an opposite end in sealing contact with said flask.

4. An apparatus as claimed in claim 3, wherein said one of said different dies includes an addendum surface thereon and said seal is angled in a direction generally away from said addendum surface.

5. An apparatus as claimed in claim 3, wherein said seal is substantially flat from said one end to said opposite end.

6. An apparatus as claimed in claim 1, further comprising an insulation enclosure at least partially surrounding said exterior periphery of said flask.

7. An apparatus for hot-gas blow-forming a sheet metal blank into a finished component, said apparatus comprising:

a flask having sides with top surfaces for supporting said sheet metal blank thereon, said flask further having internal side surfaces that define an interior of said flask, said flask being sized and adapted to receive different dies of various size and shape for hot gas blow-forming;

an insulation enclosure at least partially externally surrounding said sides of said flask;

one of said different dies having a forming surface thereon for forming said sheet metal blank into said finished component and an addendum surface circumscribing said forming surface, said one of said different dies further having external side surfaces therearound, said one of said different dies being positioned within said interior of said flask such that a peripheral gap is defined between said external side surfaces and said internal side surfaces of said flask;

a heater plate positioned within said flask and adapted to contact said one of said different dies for individually heating said one of said different dies; and

a cover positioned opposite said flask, said cover having a bead for binding said sheet metal blank between said top surfaces of said flask and said bead, said cover thereby defining a pressure chamber between said sheet metal blank and said cover.

8. An apparatus as claimed in claim 7, further comprising a peripheral seal mounted to said addendum surface of said one of said different dies so as to bridge said peripheral gap between said flask and said one of said different dies.

9. An apparatus as claimed in claim 8, wherein said peripheral seal has one end sealingly attached to said addendum surface of said one of said different dies and an opposite end in sealing contact with said flask.

10. An apparatus as claimed in claim 9, wherein said peripheral seal is angled in a direction generally away from said addendum surface of said one of said different dies and terminates in said opposite end in contact with said internal side surfaces of said flask.

11. An apparatus as claimed in claim 9, wherein said peripheral seal is substantially flat from said one end to said opposite end, said opposite end being in contact with said top surfaces of said flask.

12. An apparatus for hot-gas blow-forming a substantially two-dimensional sheet metal blank into a substantially three-dimensional finished component, said apparatus comprising:

a substantially rectangular flask having four sides with top surfaces for supporting said sheet metal blank and having internal side surfaces that define an interior, said flask being sized and adapted to receive different dies of various size and shape for hot gas blow-forming;

one of said different dies being of substantially rectangular shape and having a forming surface thereon for forming said sheet metal blank into said finished component and an addendum surface circumscribing said forming surface, said one of said different dies further having four external side surfaces therearound, said one of said different dies being positioned within said interior of said flask such that a peripheral gap is defined between said external side surfaces and said internal side surfaces of said flask;

a heater plate having electrical resistance heating elements provided therein, said heater plate being positioned within said flask and adapted to contact said one of said different dies for heating said one of said different dies; and

a substantially rectangular cover positioned opposite said flask, said cover having a bead for binding said sheet metal blank between said top surfaces of said flask and said bead, said cover thereby defining a pressure chamber between said sheet metal blank and said cover.

13. An apparatus as claimed in claim 12, further comprising a substantially rectangular peripheral seal mounted to said addendum surface of said one of said different dies so as to bridge said peripheral gap between said flask and said one of said different dies

14. An apparatus as claimed in claim 13, wherein said peripheral seal has one end sealingly attached to said addendum surface of said one of said different dies and an opposite end in sealing contact with said flask.

15. An apparatus as claimed in claim 14, wherein said peripheral seal is angled in a direction generally away from said addendum surface of said one of said different dies and terminates in said opposite in contact with said internal side surfaces of said flask.

16. An apparatus as claimed in claim 14, wherein said peripheral seal is substantially flat from said one end to said opposite end, said opposite end being in contact with said top surfaces of said flask.